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cast to essays on the most dignified subject in the whole range of the sciences. No carelessness or vulgarity in style was ever a compliment to the literary taste of a reader, and neither the cause of literature, science nor anything else is likely to be enhanced by allusions to 'some Germans nibbling' at stellar photometry; or by ponderous anecdotes about hypothetical carrots, "that grew so well that the roots reached right through to the other side of the earth."

The proof revision has been none too carefully done—illustrations on pages 60 and 116 have been interchanged; the incorrect spelling of Palitzsch would not perhaps attract attention, except that the author, being also the compiler of a handy little German-French-English lexicon, we expect better things of him; and while 'Bob' passes current everywhere for Robert, 'Boberts' will scarcely do for Roberts. The general scientific reliability of statement is fully up to the standard expected of Mr. Chambers, and only one or two inaccuracies need be pointed out—at the middle of page 18, where he should have written, 'a *vertical* plane passing through the zenith;' and on page 73, where the exact opposite of what is meant is inadvertently said, regarding the stars 'converging towards' a point in Hercules.

Of course in so small a book one must not expect everything; but some omissions are noteworthy. In even a magazine article about the stars a single page about their distances would be only too brief, but Mr. Chambers gives only this amount in a volume of 150 pages, with no allusion to the name of Bessel in this connection, or Brünnow or Gill. The classic work of Dr. Gould should not have been omitted. The superb advances of stellar photography in the hands of the brothers Henry, Russell, Gill, Barnard, Roberts, Wolf and others are barely alluded to, or left out entirely. The accurate researches on the brightness of stars by the Potsdam astronomers are wholly

ignored. If the space of six pages could be given to 'The Stars in Poetry,' and a third of that amount to speculative 'rubbish' regarding the origin of the Milky Way, is it quite the thing to have crowded out completely the nebular hypothesis, which has engaged such master minds as Herschel, La Place, Lord Kelvin and Darwin? Several chapters are almost purely descriptive, or mere geography of the heavens, as if a handbook for the use of small telescopes; a little yeast here would have done no harm; but it should be pervasive and inherent—not added as an afterthought. Mr. Maunder has appended an excellent chapter on the marvels of the spectroscope as applied to the stars and nebulæ.

It is not, however, intended to imply that there is not much that is excellent in Mr. Chambers's *Story of the Stars*, both as to form and arrangement. Its convenient size, clear type and authoritative statements (even with occasional lapses into 'dread' technicalities) render it, on the whole, an intelligible and interesting booklet, which will be a vast help to the student and general reader, and is worth double what the publishers ask for it. But the author has far from succeeded in making the most and best of his opportunity. DAVID P. TODD.

AMHERST COLLEGE.

*The World of Matter: A Guide to the Study of Chemistry and Mineralogy.* By HARLAN H. BALLARD, A. M. Boston, D. C. Heath & Co. 1894.

The object of this book is apparently to enable those who may not have an opportunity to study natural phenomena in a thorough way to obtain some comprehension of the objects and methods of scientific investigation by means of a few well chosen experiments. The object is a good one; will a study of this book further it?

It is impossible to say definitely, yes or no. The explanations, so far as they go, are generally excellent, but the tendency of the

author to preach rather than to guide, is often noticeable. After most properly bidding the student accept as fact no scientific statement capable of easy demonstration until he has proved it such, the book contains several chapters with hardly a single one of the statements made supported by experiment. For instance, we find (p. 179) that "we have now become somewhat familiar with," among other elements, "aluminum and iron; and we have incidentally become acquainted with a number of their more important compounds." Experimentally, how? Thus: The student is bidden to look for iron ore in soil, to write down what he already knows about iron, to examine the physical properties of siderite, to heat a piece of pyrite, and to note the physical properties of slate and of feldspar. That is all. Now, this is not experimental chemistry; it is boiled-down encyclopædia.

On the other hand, after having studied Ice, Water, Fire, Air, Earth and Quartz, molecules and atoms and all the other fascinating mysteries are brought in in a chapter called A Lesson in Chemistry (!); later, atomic weights are given and symbols in plenty. After having stated as facts the Laws of Chemical Combination, the author later, without further explanation, gives the following formulæ for some of the minerals the student is to work with—of course, with their names:  $\text{Fe}_7\text{S}_8$ ,  $(\text{FeMnZn})_2\text{O}_4$ ,  $(\text{CaMgAlFe})\text{SiO}_3$ ,  $(\text{KFeMgAl})_2\text{SiO}_4$ ,  $\text{Li}_6\text{Al}_6\text{Si}_3\text{O}_{45}$ ,  $(\text{CaMg})_8(\text{AlFe})_4\text{Si}_7\text{O}_{28}$ .

The directions are in some cases almost tediously explicit, and this is right; frequently, however, they err on the other side. The student is given directions to use phosphorus, and occasionally other dangerous substances, without a word of caution. Considering the inexperience of the student, and the fact of his working probably alone, this is a matter of some importance.

To sum up, if all the theoretical portion of the book, all symbols, atomic weights, etc., had been left out, and a few experiments on the *chemical properties* of substances like iron and aluminium—to mention but two—put in to fill the vacuum, Mr. Ballard's book would have filled a lack. It cannot at present—at least, unassisted.

WYATT W. RANDALL.

#### NOTES AND NEWS.

At the meeting of the trustees of Columbia College, on May 6th, President Low subscribed one million dollars for the construction of the new library building. He stated that it is to be a memorial to his father, the late A. A. Low, 'a merchant who taught his son to value the things for which Columbia College stands.' The trustees passed the following resolution:

*Resolved*, That the trustees accept with the deepest sense of gratitude the offer conveyed by President Low in his letter of May 6, 1895, subject to all the conditions therein expressed; and that the Clerk of the Board be instructed to convey to the president the thanks of the trustees for this most munificent and opportune gift, unprecedented in the scale of its generosity, and affording fresh evidence of the president's unbounded devotion to the interest of the College.

President Low's gift was accompanied by the following conditions which add to rather than detract from its value: That twelve Brooklyn scholarships for boys be established in Columbia College, and twelve Brooklyn scholarships for girls in Barnard College; that eight university scholarships, to be known as the President's University Scholarships, be established; that a university fellowship, the Class of '70 Fellowship, be established. President Low graduated in the class of '70.

At the same meeting Mr. W. C. Schermerhorn, chairman of the trustees, subscribed three hundred thousand dollars for the Natural Science Building, or other building or part of building that may be more needed.